

REMARKS

This response is being presented in response to the Examiner's action of May 23, 2002.

The Examiner has indicated that all of the claims, that is claims 1-23 and 34-43, have been rejected. In light of the amendments and following detailed arguments, it is respectfully submitted that the claims fully distinguish over the applied prior art and are in condition for allowance..

Claims 3 and 23 were rejected by the Examiner under 35 USC §112, second paragraph, as being indefinite for failing to point out and particularly claim the subject matter of the invention. In response thereto, applicant has amended claim 3 to remove the more particular subject matter. This matter has been presented in new claim 44. Claim 23 has been amended to provide proper antecedent basis for the subject matter objected to by the examiner. It is therefore believed that all the claims are in compliance with 35 USC §112, second paragraph.

The Examiner rejected claims 1, 5-8, 34-35 and 40-42 under 35 USC §102(e) as being anticipated by Saegusa et al. (US 6,126,743). The Examiner also rejected claims 4 and 18 under 35 USC §103 as being unpatentable over Saegusa et al. Claims 1, 2, 5-8, 10-16, 18, 23, 34-35 and 38-42 were also rejected under 35 USC §103 as being unpatentable over Riaz et al (US 5,385,751) in view of Saegusa et al. Claims 1, 2, 5-9, 17-22, 34-37 and 40-43 were rejected under 35 USC §103 as being unpatentable over Gallego et.al. (US 6,048,621) in view of Saegusa et al. Claim 3 was rejected under 35 USC §103 as being unpatentable over Gallego et al or Riaz et al. in view of Saegusa et al. and further in view of Tracy et al. (US 4,687,560) or alternatively Saegusa et al. in view of Tracy et al. Claims 1-3, 8, 10-14, 18, 23, 34, 38-40 and 42 were

rejected under 35 USC §103 as being unpatentable over Proscia (US 5,286,520) in view of Tracy et al. Claims 1-3, 8, 34, 35, 40 and 42 were rejected under 35 USC §103 as being unpatentable over Dai et al. (XP-002123373).

The present invention provides a process for the production of a tungsten oxide coating which uses particular tungsten precursors and which is carried out in a temperature range (500°-720° than was previously contemplated. This allows coatings to be deposited within a range of stoichiometries. The higher temperatures of the range offer advantages in the on-line production of coated glass, as there is an improved opportunity to deposit an additional coating or coatings on-line.

Rejection of claims 1, 5-8, 34-35 and 40-42 under 35 USC §102(e) as being anticipated by Saegusa et al

Claim 1 is directed to a process for depositing a coating comprising tungsten oxide on the surface of a glass substrate through the use of a CVD process. The reference discloses a process for the production of glass ceramics which are mixed oxides. In column 3 lines 1-10, Saegusa noted that these oxides comprise a mixture of elements designated X, M and G, wherein tungsten is listed as one of thirteen possibilities recited for M. CVD is one of six possible processes for deposition cited. It is further noted that these mixed oxides can be deposited on a variety of substrates (column 11, line 26) of which glass is one of six possibilities specifically cited. None of the examples show the deposition of a coating comprising tungsten oxide, nor do they show a coating deposited by a CVD process, nor did any of the examples show a coating deposited on a glass substrate.

Therefore is respectfully submitted that the examiner has cited a set of possibilities chosen from a substantial set of options where there was no suggestion of any particular utility of the options chosen by the examiner. Such a selection from such a broad list of possibilities does not anticipate the claims of the present invention. It is only through a hindsight analysis that the examiner would be motivated to look at those specific possibilities. It is therefore respectfully submitted that claim 1 is not anticipated by Saegusa. Claims 4 and 8 were rejected under Saegusa under 35 USC §103 and are believed to be allowable based, at least, upon their dependence from an allowable base claim.

Rejection of claims 1, 2, 5-8, 10-16, 18, 23, 34-35 and 38-42 under 35 USC §103 as being unpatentable over Riaz et al (US 5,385,751) in view of Saegusa et al.

These examiner states that Riaz describes the process for coating a glass substrate with a fluorine doped tungsten oxide layer at a temperature of from 300-500 °C. The examiner acknowledges that Riaz does not teach the use of tungsten chloride or a tungsten oxyhalide as the precursor. It is additionally submitted that Riaz does not teach or suggest coating a glass substrate at a temperature from about 500°C to 720°C, as is claimed in claim 1.

It is respectfully submitted that the Examiner's combination of Riaz and Saegusa is not valid. Saegusa teaches the deposition of mixed oxide dielectrics. It is respectfully submitted that one skilled in the art looking to deposit a tungsten oxide on glass would not have considered Saegusa relevant and thus would not have been motivated to combine the applied references. Even if they were to be combined, Saegusa, as discussed above, does not provide any real

teaching relating to the deposition of tungsten oxide coatings by CVD, instead providing only a passing reference which is insufficient to show one skilled in the art how to make the invention. Therefore, the present claim 1 is distinguishable over the applied combination.

Rejection of claims 1, 2, 5-9, 17-22, 34-37 and 40-43 under 35 USC §103 as being unpatentable over Gallego et al. in view of Saegusa et al.

Gallego discloses a coating on glass which may comprise a tungsten oxide layer. The Examiner indicates that this layer may be deposited by CVD and refers to EP 546699 as disclosing such a process. The Examiner again points to the Saegusa reference to teach the utility of a CVD process in the deposition of tungsten chloride. Applicants continue to assert that the Saegusa reference is irrelevant to the present invention, for the reasons asserted above. It is therefore submitted that the combination of Gallego and Saegusa is invalid, and does not render obvious the present invention as claimed in claim 1.

Rejection of claim 3 under 35 USC §103 as being unpatentable over Gallego et al or Riaz et al. in view of Saegusa et al. and further in view of Tracy et al. or alternatively Saegusa et al. in view of Tracy et al.

Claim 3 is a dependent claim depending from claim 1. For the reasons stated in the preceding and following paragraphs it is submitted that claim 1 is distinguishable over the applied references. Therefore, it is submitted that this rejection is moot, and claim 3 is allowable based, at least, upon its dependence from claim 1.

Even if this were not the case, however, the Examiner relies on the Tracey reference to show tungsten oxide, using tungsten tetraoxychloride as a precursor in a CVD process. (It is

noted that the Examiner here refers to tungsten chloride in his Action, but it is believed that tungsten oxide was the intended reference.) It is respectfully submitted that Tracey does not, however, show the deposition of tungsten in a CVD process. Tracey shows a coating deposition from a tungsten tetraoxychloride precursor occurring in a vacuum process. There is no suggestion in Tracey of depositions occurring in a CVD process, and thus it is improper for the Examiner to cite Tracey as showing the use of a tungsten tetraoxychloride precursor in a CVD process. Therefore, Claim 3 is also distinguishable over the applied references on this basis.

Rejection of claims 1-3, 8, 10-14, 18, 23, 34, 38-40 and 42 under 35 USC §103 as being unpatentable over Proscia in view of Tracy et al.

The Examiner acknowledges that the Proscia reference fails to teach the use of any alternative precursors. The Examiner further acknowledges that Proscia fails to teach depositions occurring at the temperatures cited in claim 1. With regard to the Tracey reference, as discussed above, this reference deals with vacuum deposition process, and not CVD processes. Therefore, it is submitted that it is improper to combine the Tracey reference with the Proscia reference. Further, even if these references could be combined, since the Tracey reference utilizes a vacuum CVD process, their combination would not show the present invention as claimed in claim 1.

Rejection of claims 1-3, 8, 34, 35, 40 and 42 under 35 USC §103 as being unpatentable over Dai et al.

Dai discloses plasma enhanced CVD processes which are carried out at a lower temperature than that required by claim 1, i.e. a temperature of 100°C. Further, looking at Figure 1 of Dai, this figure illustrates that the deposition rate decreases as the heating current, i.e.

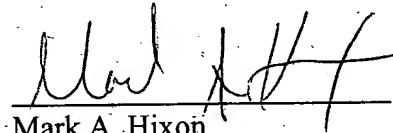
temperature increases. Therefore, it would not be obvious, and in fact would not be acceptable to operate the process of Dai at an elevated temperature. One skilled in the art would certainly not think to elevate the temperature when it is known to decrease deposition rates. It is therefore not obvious to use the precursor of Dai in a CVD process which is carried out at significantly higher temperatures. Dai, in fact, refutes the Examiner's assertion that deposition rates will always increase with temperature. Riaz, Proscia and Dai are all carried out at much lower temperatures than are contemplated by the present invention. Thus it is respectfully submitted that claim 1 also distinguishes over the Dai reference.

Applicant's invention is based upon the discovery that tungsten oxide may be deposited using tungsten chloride or a tungsten oxyhalide at higher deposition temperatures to give improved products and improved processes for coating glass.

Any dependent claims not specifically discussed hereinabove are believed to be allowable based, at least, upon their dependence on allowable base claims as discussed above.

In view of the above remarks, a favorable reconsideration of the present application and the passing of this application to issue with all claims allowed are courteously solicited. If the Examiner wishes to modify any of the language of the claims in an effort to move the application towards allowance, a telephone call to the undersigned would be greatly appreciated.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In The Claims:

1. (Twice Amended) A process for depositing a coating comprising tungsten oxide on the surface of a glass substrate to produce a glass which transmits a high percentage of incident light by directing a gaseous stream comprising tungsten oxyhalide or tungsten chloride and a source of oxygen on to the surface of the glass substrate, wherein the glass substrate is at a temperature in the range 500°C to 720°C.
3. (Twice Amended) A process according to claim 1 wherein tungsten oxyhalide comprises a tungsten oxychloride [, preferably tungsten oxytetrachloride].
23. (Twice Amended) A process according to claim 1 wherein the process is performed during [the] a float glass production process.

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